

NOTES ON ARIZONA *ASCLEPIAS* (ASCLEPIADACEAE) WITH  
A NEW COMBINATION

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ABSTRACT

Relationships between several pairs of closely related *Asclepias* taxa from the western United States are discussed. A new combination, *A. uncialis* E. Greene var. *ruthiae* comb. nov., is proposed.

KEY WORDS: *Asclepias*, Asclepiadaceae, Arizona

Introduction

In the "Contributors' Guide for the New *Vascular Plants of Arizona*," the editorial committee recommends a conservative view in the recognition of species. "A describable morphological discontinuity between species is essential. Members of complexes that intergrade considerably in morphology are considered in infraspecific rank, and those that have no consistently diagnostic morphological characters are not treated formally." This is sensible editorial policy for a manual that will be broadly used; it is also sound taxonomy in the orthodox tradition, the lineal descendent of Charles Darwin's (1859) observation that "wide-ranging, much diffused, and common species vary most." At the inception of phylogenetic taxonomy, Darwin was able to clarify the role of the taxonomist who tries to make sense of this variability: "We have seen that there is no infallible criterion by which to distinguish species and well-marked varieties; and when intermediate links have not been found between doubtful forms, naturalists are compelled to come to a determination by the amount of difference between them, judging by analogy whether or not the amount suffices to raise one or both to the rank of species." Recognizable and describable discontinuities between groups do not automatically indicate species status or even formal taxonomic recognition for those groups; the discontinuities must also be significant.

During preparation of a treatment of the Asclepiadaceae for the Arizona flora project, I have puzzled over specimens representing several pairs of closely related *Asclepias* taxa. In his monograph of the North American species of *Asclepias*, Woodson (1954) recognized all of them at the rank of species: *A. engelmanniana* Woods. and *A. rusbyi* (Vail) Woods.; *A. involucrata* Engelm. ex Torr. and *A. macrosperma* Eastwood, and *A. uncialis* E. Greene and *A. ruthiae* Maguire. Yet the determinations supplied by Arizona botanists for their own, local collections of those taxa, in particular the first two pairs, suggest that Woodson's treatment is unsatisfactory. Annotations and re-annotations, sometimes by the same individual, pepper many of the specimens, jumping back and forth between the taxa in question. Woodson rightly described the species of *Asclepias* in the United States as "unusually well defined and properly appreciated by the botanical public." In order to more satisfactorily reflect the magnitude of their affinities, that is, "judging by analogy," it seems practical, in light of available taxonomic information, to restrict recognition of those taxa to infraspecific rank.

*Asclepias uncialis* E. Greene

*Asclepias uncialis* comprises a poorly understood complex of intergrading morphological phases from widely scattered localities on the high deserts and dry plains of Nevada, Utah, Colorado, Arizona, and New Mexico. Included in this complex are the more robust, broader leaved plants hitherto separated from *A. uncialis* as *A. ruthiae* (and including *A. eastwoodiana* Barneby). Whether those plants deserve formal recognition at even the infraspecific level is a question that future taxonomic and biosystematic studies must answer. My own morphological examination indicates that maintaining distinct entities at the rank of species is not warranted: I can find no clear, consistent, and significant discontinuity. For purposes of a floristic treatment of the Milkweed Family for the state of Arizona, where *A. uncialis* is not only rare, but represented by its extreme forms, it seems best to formally retain those forms at infraspecific rank. Therefore, the following new combination is proposed:

*Asclepias uncialis* E. Greene var. *ruthiae* (Maguire in Maguire & Woodson) Sundell, *comb. nov.* BASIONYM: *Asclepias ruthiae* Maguire in Maguire & Woodson, Ann. Missouri Bot. Gard. 28:245. 1941.

*Asclepias eastwoodiana* Barneby, Leaflet. W. Bot. 4:210. 1945.

*Asclepias sanjuanensis* Heil, Porter & Welsh, Great Basin Naturalist 49:100. 1989.

Extreme forms of the two varieties can be distinguished according to the following key:

1. Plants relatively small, stems to 0.5-1 dm long; lower leaf blades lanceolate, grading to linear lanceolate or linear above, pubescent only on the margins and veins; flowers relatively small, corolla lobes 3-4 mm long, anther wings 1.1-1.4 mm long; crown hoods with marginal lobes well developed, the horns tangentially flat ..... var. *uncialis*
1. Plants relatively large, stems mostly 1-2 dm long; lower leaf blades mostly ovate, broadly elliptic or circular, grading to narrowly ovate or broadly lanceolate above, margins pubescent, upper and lower surfaces pubescent to glabrous; flowers relatively large, corolla lobes 4-6 mm long, anther wings 1.3-1.7 mm long; crown hoods with marginal lobes indistinct to well developed, the horns subdigitate ..... var. *ruthiae*

*Asclepias uncialis* var. *uncialis* occurs in the southern and eastern portion of the species' range, from western Arizona and southwestern New Mexico to Colorado and western Oklahoma; var. *ruthiae* is found farther to the west, where it appears to be more common, or at least more frequently collected, from central Nevada to southeastern Utah, northern Arizona, and northwestern New Mexico. Plants recently described as *A. sanjuanensis* (Heil, et al. 1989) from northwestern New Mexico are somewhat intermediate and, in stature, leaf outline, and crown form, bridge an already indistinct morphological gap.

Collections of the typical variety of *Asclepias uncialis* are apparently uncommon, a situation that tends to promote species inflation based on minor discontinuities. Of particular interest is an Alice Eastwood collection (8259, GH [photocopy seen], US!) from Silver City, New Mexico, the type locality, exhibiting a more robust habit and, as far as I am able to judge, indistinguishable from type material of *A. sanjuanensis* (Heil 4338, NMC!). The authors of *A. sanjuanensis* recognize a distant affinity to *A. uncialis*, but tentatively derive their new species, as well as *A. eastwoodiana*, from the geographically intermediate *A. ruthiae*. Collection of additional flowering and fruiting material from Arizona and western New Mexico will help to resolve the problem, most likely by further blurring the distinctions between these various entities.

*Asclepias involucrata* Engelm. ex Torr.

*Asclepias involucrata* of the southwestern United States and northern México is so variable in pubescence, leaf outline, and crown form, that its distinctiveness has been insufficiently appreciated. At least in Arizona, where it is sufficiently common to be rather well represented in state herbaria, the dwarf, spreading habit, more or less erect leaves with short-wooly margins, and terminal, bracteate umbels clearly mark it as a cohesive genetic and taxonomic

entity. In the northern part of the state, plants in some populations exhibit one or more of the following character extremes: ovate leaves (especially the lower ones), persistent wooly pubescence on leaf undersurfaces, oblong and upright crown hoods, and larger seeds. These have been segregated as *Asclepias macrosperma* or *A. involucrata* var. *tomentosa* Eastwood. However, these character states do not consistently correlate, nor are there clear morphological discontinuities discernible between contrasting conditions. Like McDougall (1973), I am unable to treat such plants formally.

#### *Asclepias engelmanniana* Woods.

This tall and distinctive milkweed is a common element of prairies and floodplains on the high plains of Nebraska, Colorado, and Kansas. To the southwest, it ranges as far as Arizona, where it occurs sporadically along creeks and in open woodlands in the northeastern half of the state. Plants with more or less well developed crown horns have been recognized by Kearney & Peebles (1960) at the infraspecific level as *A. engelmanniana* var. *rusbyi* (Vail) Kearney (*A. rusbyi* Vail). Most Arizona plants possess at least a nub of a horn and, with some misgiving, are assigned here. However, even within the same collection (*Lehto L23157* from Gila Co.), the horn can vary from well developed (ca. 1 mm long and scarcely exerted beyond the hood rim [ARIZ!]) to entirely suppressed and represented by a ridge at the base of the back wall of the hood (ASU!). Typical *A. engelmanniana* of the Great Plains, lacks both the horn and the ridge.

#### Additional Problems

Two additional pairs of species, each with one representative in the Arizona flora, pose similar, unresolved taxonomic problems.

*Asclepias angustifolia* Schweig. of México and southern Arizona has never been circumscribed broadly enough to include the relatively localized *A. texana* Heller of south Texas and northeast México. In the United States, the species are easily separated morphologically by leaf outline, mostly linear to narrowly lanceolate, to 12 cm long, in *A. angustifolia*, mostly oval to oblong elliptic, to 7 cm long, in *A. texana*. The difference is distinct, but certainly no greater than that between, e.g., the subspecies of *Sarcostemma cynanchoides* Decne., also of the American Southwest. Plants with somewhat intermediate leaf outlines occur in northern México and, based on specimens at ARIZ, have no trouble passing as *A. angustifolia* to Arizona botanists and as *A. texana* to their Texas colleagues! Ecologically, the species differ very little, occurring along creeks and canyons in rocky and otherwise arid country.

*Asclepias nyctaginifolia* A. Gray of California, Arizona, and New Mexico is clearly a segregate of *A. oenotherioides* Cham. & Schlecht., which ranges from Texas southward into much of Central America. The species are maintained based on differences in the length and basal taper of the crown hoods. Invoking the Darwinian method of analogy to other members of the genus, I would suggest that the distinction, if it were to survive the examination of currently available specimens, is weak and the taxa good candidates for taxonomic reappraisal.

#### Good Field Notes for Milkweed Collections

Good morphological information accompanying milkweed collections is rare. In the arid Southwest, most *Asclepias* species are relatively undercollected. For example, of the 26 species of *Asclepias* recognized in Arizona, only five were sufficiently represented, among the specimens borrowed from the major Arizona herbaria, to occupy more than a single shelf in a herbarium case. Few botanists could be familiar with those milkweeds in the field. Thus the recording of appropriate detailed morphological data is not at all a formality.

Useful information that is more often than not lacking on milkweed collections includes the following:

- root morphology
- habit; in particular, stem number, disposition, and length
- corolla form and disposition, particularly of the lobes
- crown form: standard botanical terms are not always available to describe the three dimensional form and disposition of the hoods
- flower color: corolla, crown, and anther head should be noted.

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